

Serial No.: 10/779,481
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II. AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in this Application:

1. (canceled)

2. (currently amended) Method for diagnosing a critical state of charge condition of an energy storage system as claimed in ~~claim 1~~ claim 4 wherein the predetermined criteria are characterized by increasingly less tolerance for charge power flow at increasingly higher state of charge.

3. (currently amended) Method for diagnosing a critical state of charge condition of an energy storage system as claimed in ~~claim 1~~ claim 4 wherein the predetermined criteria are characterized by increasingly less tolerance for discharge power flow at increasingly lower state of charge.

4. (currently amended) ~~The method for monitoring an energy storage system state of charge as claimed in claim 1~~ Method for diagnosing a critical state of charge condition of an energy storage system, comprising:

obtaining power flow and state of charge for the energy storage system;

determining if the combination of power flow and state of charge meet predetermined criteria;

if the predetermined criteria are met, indicating a critical state of charge condition if the state of charge is outside of a predetermined region of state of charge for a predetermined duration;

wherein the predetermined duration is a function of the state of charge that generally decreases as the state of charge trends away from the predetermined region of state of charge and generally increases as the state of charge trends toward the predetermined region of state of charge.

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5. (original) Method for diagnosing a critical state of charge condition of an energy storage system, comprising:

establishing charge and discharge thresholds for the energy storage system as a function of state of charge within predetermined regions of extreme high and low state of charge, respectively;

obtaining energy storage system power and state of charge;

comparing the energy storage system power to the appropriate one of the charge and discharge thresholds after the state of charge enters one of the predetermined regions of high and low state of charge from an intermediate region of state of charge;

if the energy storage system power violates the appropriate one of the charge and discharge thresholds while the state of charge is within the one of the predetermined regions of high and low state of charge, monitoring the duration that the state of charge remains within the one of the predetermined regions of high and low state of charge; and,

if the duration exceeds a predetermined duration, providing an indication of a critical state of charge condition.

6. (original) The method for monitoring an energy storage system state of charge as claimed in claim 5 wherein the predetermined duration is a function of the state of charge that generally decreases as the state of charge moves away from the intermediate region of state of charge and generally increases as the state of charge moves toward the intermediate region of state of charge.

7. (original) Method for diagnosing a critical state of charge condition of an energy storage system, comprising:

within a predefined extreme range of state of charge, providing a plurality of state of charge thresholds and a corresponding plurality of unique increment values, said increment values being larger the further away the corresponding state of charge threshold is from a predefined non-extreme range of state of charge;

periodically obtaining state of charge;

for so long as state of charge is outside of the predefined range of non-extreme state of charge

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comparing the state of charge to the state of charge thresholds and selecting one of said increments in accord with the comparison;

incrementing a counter with the selected increment;

comparing the counter to a counter limit; and

providing an indication of a critical state of charge condition if said counter exceeds said counter limit.

8. (original) The method for diagnosing a critical state of charge condition of an energy storage system as claimed in claim 7 wherein the predefined extreme range of state of charge corresponds to high state of charge.

9. (original) The method for diagnosing a critical state of charge condition of an energy storage system as claimed in claim 7 wherein the predefined extreme range of state of charge corresponds to low state of charge.

10. (new) Method for diagnosing a critical state of charge condition of an energy storage system, comprising:

obtaining power flow and state of charge for the energy storage system;

detecting an incipient threat to the energy storage system condition as a function of energy storage system state of charge and energy storage system power flow when energy storage system exceeds a predetermined high state of charge, wherein detecting an incipient threat to the energy storage system condition is increasingly sensitive to energy storage system power flow into the energy storage system as energy storage system state of charge increases; and

subsequent to detecting an incipient threat to the energy storage system condition, diagnosing a critical state of charge condition if the state of charge exceeds the predetermined high state of charge for a duration that is variable as a function of the state of charge, wherein the duration is reduced as energy storage system state of charge increases.

11. (new) Method for diagnosing a critical state of charge condition of an energy storage system, comprising:

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obtaining power flow and state of charge for the energy storage system;

detecting an incipient threat to the energy storage system condition as a function of energy storage system state of charge and energy storage system power flow when energy storage system is below a predetermined low state of charge, wherein detecting an incipient threat to the energy storage system condition is increasingly sensitive to energy storage system power flow out of the energy storage system as energy storage system state of charge decreases; and

subsequent to detecting an incipient threat to the energy storage system condition, diagnosing a critical state of charge condition if the state of charge is below the predetermined low state of charge for a duration that is variable as a function of the state of charge, wherein the duration is reduced as energy storage system state of charge decreases.